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# RESEARCH MEMORANDUM

EVALUATION OF GUST AND DRAFT VELOCITIES FROM  
FLIGHTS OF P-61C AIRPLANES WITHIN THUNDERSTORMS  
SEPTEMBER 5, 1946 TO SEPTEMBER 10, 1946  
AT ORLANDO, FLORIDA

By

H. B. Tolefson

Langley Memorial Aeronautical Laboratory  
Langley Field, Va.

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

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Tables I and II of this report summarize the gust and draft velocity data for thunderstorm flights 31, 32, and 33 of September 5, 1946, September 6, 1946, and September 10, 1946, respectively. These data were evaluated from records of NACA instruments installed in P-61C airplanes and are of the type presented in reference 1 for previous flights.

Table III summarizes the readings of a milliammeter which was used in conjunction with other equipment to indicate ambient-air temperature during thunderstorm surveys. These data were read from motion-picture records of the instrument and include all cases in which variations in the instrument indications were noted for the present flights.

Langley Memorial Aeronautical Laboratory  
National Advisory Committee for Aeronautics  
Langley Field, Va.

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Approved:

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## REFERENCE

1. Tolefson, H. B.: Evaluation of Gust and Draft Velocities from Flights of P-61C Airplanes within Thunderstorms August 23, 1946 to September 4, 1946 at Orlando, Florida. NACA RM No. L7A14, 1947.

TABLE I.- SUMMARY OF GUST MEASUREMENTS FROM FLIGHTS  
OF P-61C AIRPLANES WITHIN THUNDERSTORMS

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{emax}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts		
September 5, 1946 - Flight 31							
Airplane 333 { Time (EST) 153900 - 154129 Traverse 1 { Length of traverse 165.5 sec, 60,135 ft Initial heading (deg) 360							
0 - 3	26,500	----	----	----	0		
3 - 6		----	----	----	0		
6 - 9		----	----	----	0		
9 - 12		----	----	----	0		
12 - 15		----	-3.4	----	275	1	
15 - 18	26,000	10.9	-5.9	5.6	173	6	
18 - 21		9.1	-5.9	----	----	4	
21 - 24		4.4	-4.4	----	----	2	
24 - 27		6.9	-4.1	----	----	2	
27 - 30		6.6	----	----	----	1	
30 - 33		8.1	-7.8	----	----	4	
33 - 36		11.9	-3.7	----	----	4	
36 - 39		7.5	-6.2	----	----	5	
39 - 42		5.0	----	----	----	2	
42 - 45		8.4	-3.1	----	----	3	
45 - 48		5.0	-4.1	----	-11.2	184	2
48 - 51		8.1	-5.3	12.2	75	2	
51 - 54		----	----	----	----	0	
54 - 57		----	----	----	----	0	
57 - 60		----	----	----	----	0	
60 - 63		----	----	----	----	0	
Airplane 333 { Time (EST) 155109 - 155441 Traverse 2 { Length of traverse 232.6 sec, 85,328 ft Initial heading (deg) - 60							
0 - 3	26,000	----	----	----	0		
3 - 6		----	----	----	0		
6 - 9		----	----	----	0		
9 - 12		----	----	----	0		
12 - 15		----	----	----	0		
15 - 18		----	----	----	0		
18 - 21		----	----	----	0		
21 - 24		----	----	----	0		

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts	
September 5, 1946 - Flight 31						
Airplane 333 Traverse 2		{ Time (EST) 155109 - 155441 Length of traverse 232.6 sec, 85,328 ft Initial heading (deg) - 60				
24 - 27	26,000	----	----	----	0	
27 - 30		----	----	----	0	
30 - 33		----	----	----	0	
33 - 36		----	----	----	0	
36 - 39		----	----	----	0	
39 - 42		4.3	----	----	1	
42 - 45		8.7	-6.5	-12.2	105	3
45 - 48		12.1	-8.1	-13.7	35	4
48 - 51		6.5	-6.2	----	----	3
51 - 54		10.5	-3.4	12.0	84	4
54 - 57	25,500	5.0	-3.4	-8.0	253	3
57 - 60		7.4	----	7.5	118	3
60 - 63		5.6	-7.4	-9.1	189	4
63 - 66		7.1	-2.8	-7.4	153	2
66 - 69		7.4	-3.7	----	----	3
69 - 72	26,000	5.9	-4.0	12.1	108	4
72 - 75		----	-4.0	----	----	1
75 - 78		4.3	-4.0	-8.0	178	4
78 - 81		4.0	-4.6	----	----	2
81 - 84		----	----	----	----	0
84 - 87		----	----	----	----	0
Airplane 333 Traverse 3		{ Time (EST) 155804 - 155948 Length of traverse 135.5 sec, 47,962 ft Initial heading (deg) 270				
0 - 3	26,000	----	----	----	0	
3 - 6		1.9	----	----	1	
6 - 9		----	----	----	0	
9 - 12		----	----	----	0	
12 - 15		----	----	----	0	
15 - 18		----	----	----	0	
18 - 21		----	----	----	0	
21 - 24		8.3	-6.2	----	----	3
24 - 27		4.3	-4.0	----	----	2
27 - 30		4.0	----	----	----	1

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts	
September 5, 1946 - Flight 31						
Airplane 333 Traverse 3		{ Time (EST) 155804 - 155948 Length of traverse 135.5 sec, 47,962 ft Initial heading (deg) 270				
30 - 33	26,000	----	----	----	0	
33 - 36		----	----	----	0	
36 - 39		----	----	----	0	
39 - 42		4.0	-4.0	8.0	183	2
42 - 45		5.6	----	----	----	2
45 - 48		----	----	----	0	
Airplane 348 Traverse 1		{ Time (EST) - (a) Length of traverse 202.4 sec, 70,952 ft Initial heading (deg) (b)				
0 - 3	21,000	----	----	----	0	
3 - 6		----	----	----	0	
6 - 9		----	----	----	0	
9 - 12		----	----	----	0	
12 - 15		16.6	-8.8	----	3	
15 - 18		9.1	-9.7	----	6	
18 - 21		5.6	-6.3	----	3	
21 - 24		11.0	-10.0	----	6	
24 - 27		12.9	-11.0	----	7	
27 - 30		10.4	-13.5	----	3	
30 - 33		9.7	-6.6	----	5	
33 - 36		7.2	-6.3	----	6	
36 - 39	21,500	5.6	-10.4	----	3	
39 - 42		2.8	-6.3	8.9	139	2
42 - 45		4.7	-6.3	----	3	
45 - 48	21,000	----	-4.4	----	73	2
48 - 51		6.0	-3.1	----	----	2
51 - 54		----	-3.1	----	----	1
54 - 57		----	-3.5	----	----	1
57 - 60		----	-3.1	----	----	1
60 - 63		----	-4.4	----	----	1
63 - 66		----	----	----	----	0
66 - 69		----	-4.4	----	----	1
69 - 72		----	----	----	----	0

<sup>a</sup>Clock not in field of view of camera.

<sup>b</sup>Heading not readable in motion-picture records.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 5, 1946 - Flight 31								
Airplane 348 Traverse 2		{ Time (EST) - (a) Length of traverse 135.4 sec, 45,542 ft Initial heading (deg) - (b)						
0 - 3	21,000	----	----	----	----	0		
3 - 6		7.2	----	----	----	2		
6 - 9		----	-6.9	----	----	3		
9 - 12		----	-4.7	----	----	1		
12 - 15		----	----	----	----	0		
15 - 18		----	----	----	----	0		
18 - 21		4.7	----	----	----	2		
21 - 24		5.0	-3.8	----	----	2		
24 - 27		----	-5.0	----	----	1		
27 - 30		----	----	----	----	0		
30 - 33		----	----	----	----	0		
33 - 36		----	----	----	----	0		
36 - 39		----	----	----	----	0		
39 - 42		----	----	----	----	0		
42 - 45		----	----	----	----	0		
45 - 48		----	----	----	----	0		
Airplane 348 Traverse 3		{ Time (EST) - (a) Length of traverse 218.1 sec, 73,672 ft Initial heading (deg) 270						
<sup>c</sup> 0 - 3	21,000							
3 - 6								
6 - 9								
9 - 12								
<sup>c</sup> 12 - 15								
<sup>c</sup> 15 - 18	20,500	4.7	-8.1	14.4	-18.7	102	138	7
18 - 21		----	----	----	----	----	----	0
21 - 24		11.2	-10.3	22.6	----	138	----	5
24 - 27		----	----	----	----	----	----	0
27 - 30		----	----	----	----	----	----	0
30 - 33		----	----	----	----	----	----	0
33 - 36		----	----	----	----	----	----	0
36 - 39	21,000	----	----	----	----	----	----	0
39 - 42		----	----	----	----	----	----	0

<sup>a</sup>Clock not in field of view of camera.<sup>b</sup>Heading not readable in motion-picture records.<sup>c</sup>Records for 0- to 18,000-foot portion of traverse not obtained.
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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity U <sub>max</sub> (fps)	Maximum true gust velocity U <sub>tmax</sub> (fps)	Gust gradient distance (ft)	No. of gusts
September 5, 1946 - Flight 31					
Airplane 348 Traverse 3		{ Time (EST) - (a) Length of traverse 218.1 sec, 73,672 ft Initial heading (deg) 270			
42 - 45	21,000	----	----	----	0
45 - 48		----	-3.7	----	1
48 - 51		----	----	----	0
51 - 54		----	----	----	0
54 - 57		4.7	-4.4	----	5
57 - 60		7.8	-8.7	----	3
60 - 63		7.8	----	----	1
63 - 66		----	-3.7	----	1
66 - 69		----	----	----	0
69 - 72		----	-3.7	----	1
72 - 75		----	----	----	0
Airplane 345 Traverse 1		{ Time (EST) - (d) Length of traverse 36.0 sec, 8,824 ft Initial heading (deg) - (d)			
0 - 3	10,500	----	-4.5	----	1
3 - 6		4.5	-5.1	----	4
6 - 9		4.5	-5.1	----	5
Airplane 345 Traverse 2		{ Time (EST) - (d) Length of traverse 126.2 sec, 31,161 ft Initial heading (deg) - (d)			
0 - 3	10,500	4.7	-7.5	19.8	4
3 - 6		11.9	-7.2	----	11
6 - 9		10.4	-9.1	----	7
9 - 12	11,000	7.5	-9.4	----	8
12 - 15		7.5	-9.4	----	6
15 - 18		6.0	-6.9	11.1	4
18 - 21		3.8	-5.7	2.4	4
21 - 24		----	-6.6	----	1
24 - 27		----	----	----	0
27 - 30		----	----	----	0
30 - 33		----	----	----	0

<sup>a</sup>Clock not in field of view of camera.

<sup>d</sup>No motion-picture records obtained.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)	No. of gusts	
September 5, 1946 - Flight 31								
Airplane 345 Traverse 3		{ Time (EST) - (d) Length of traverse 312.2 sec, 76,354 ft Initial heading (deg) - (d)						
0 - 3	10,500	3.7	-3.7	----	-6.5	----	72	2
3 - 6		5.9	-3.4	----	-----	-----	-----	3
6 - 9		5.3	-2.8	----	-----	-----	-----	4
9 - 12		5.6	-5.0	----	-6.5	----	74	5
12 - 15		5.9	-5.0	----	-----	-----	-----	6
15 - 18		10.0	-4.7	9.2	-----	49	-----	5
18 - 21		-----	-6.9	-----	-6.4	-----	50	4
21 - 24		8.1	-----	16.7	-----	37	-----	2
24 - 27		-----	-5.3	-----	-----	-----	-----	2
27 - 30		-----	-3.7	-----	-5.9	-----	45	2
30 - 33		6.9	-3.7	-----	-----	-----	-----	2
33 - 36		-----	-4.1	-----	-4.9	-----	76	4
36 - 39		12.8	-20.3	-----	-----	-----	-----	5
39 - 42		5.9	-3.1	11.1	-----	49	-----	4
42 - 45		7.5	-4.7	-----	-----	-----	-----	6
45 - 48	13.1	-11.9	-----	-----	-----	-----	9	
48 - 51	10.0	-6.6	-----	-----	-----	-----	6	
51 - 54	11,000	13.4	-11.5	-----	-----	-----	-----	10
54 - 57		4.4	-8.4	-----	-----	-----	-----	9
57 - 60		-----	-5.3	-----	-----	-----	-----	1
60 - 63	10,500	6.2	-5.0	-----	-----	-----	-----	4
63 - 66		-----	-----	-----	-----	-----	-----	0
66 - 69		5.9	-5.0	-----	-----	-----	-----	6
69 - 72	11,000	-----	-----	-----	-9.7	-----	102	1
72 - 75		-----	-----	-----	-----	-----	-----	0
75 - 78		-----	-3.1	-----	-----	-----	-----	1
Airplane 345 Traverse 4		{ Time (EST) - (d) Length of traverse 298.0 sec, 72,303 ft Initial heading (deg) - (d)						
0 - 3	10,500	-----	-----	-----	-----	-----	-----	0
3 - 6		-----	-----	-----	-----	-----	-----	0
6 - 9		-----	-----	-----	-----	-----	-----	0
9 - 12		-----	-----	-----	-----	-----	-----	0
12 - 15		-----	-----	-----	-----	-----	-----	0

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity U <sub>emax</sub> (fps)	Maximum true gust velocity U <sub>tmax</sub> (fps)	Gust gradient distance (ft)	No. of gusts
September 5, 1946 - Flight 31					
Airplane 345 Traverse 4		{ Time (EST) - (d) Length of traverse 298.0 sec, 72,303 ft Initial heading (deg) - (d)			
15 - 18	10,500	----	----	----	0
18 - 21		----	-6.8	----	1
21 - 24		----	----	----	0
24 - 27		2.8	----	----	1
27 - 30		----	----	----	0
30 - 33		----	-4.7	----	1
33 - 36		----	-3.7	----	1
36 - 39		4.0	-5.3	----	3
39 - 42		----	-11.2	3.6	5
42 - 45		7.8	-6.2	----	3
45 - 48		6.2	-4.7	----	4
48 - 51		5.9	-6.8	----	5
51 - 54		8.7	-10.3	----	6
54 - 57		6.2	-6.2	----	5
57 - 60		----	-6.5	----	3
60 - 63		3.7	-4.0	----	5
63 - 66	----	-3.1	----	1	
66 - 69	----	-5.0	----	1	
69 - 72	5.9	-9.6	----	5	
Airplane 351 Traverse 1		{ Time (EST) 150853 - 151015 Length of traverse 89.9 sec, 23,459 ft Initial heading (deg) 350			
0 - 3	5,500	9.6	-5.1	15.9	7
3 - 6		8.0	-9.9	----	7
6 - 9		----	----	----	0
9 - 12		6.7	-4.2	----	4
12 - 15		3.2	-5.7	----	4
15 - 18		----	-15.3	----	8
18 - 21		----	----	----	1
21 - 24		----	-3.2	7.7	3

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{max}$ (fps)	Maximum true gust velocity $U_{tmax}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 5, 1946 - Flight 31								
Airplane 351 { Time (EST) 153257 - 153427 Traverse 2 { Length of traverse 102.2 sec, 25,665 ft Initial heading (deg) 30								
0 - 3	5,500	7.2	-3.8	----	-6.1	----	80	3
3 - 6		5.0	-11.6	----	----	----	----	6
6 - 9		10.7	-9.8	13.7	----	108	----	9
9 - 12	6,000	----	-1.6	----	-6.8	----	145	5
12 - 15		----	-6.3	----	----	----	----	1
15 - 18	5,500	----	----	----	----	----	----	0
18 - 21		4.4	----	----	----	----	----	2
21 - 24		----	----	----	----	----	----	0
24 - 27		----	----	----	----	----	----	0
Airplane 351 { Time (EST) 154257 - 154611 Traverse 3 { Length of traverse 211.0 sec, 53,612 ft Initial heading (deg) 95								
0 - 3	5,500	4.4	-4.1	16.2	----	77	----	2
3 - 6		----	----	----	----	----	----	0
6 - 9		----	----	----	----	----	----	0
9 - 12		----	----	----	----	----	----	0
12 - 15		----	----	----	----	----	----	0
15 - 18		----	----	----	----	----	----	0
18 - 21		6.6	----	----	-6.4	105	----	2
21 - 24		12.2	----	----	----	----	----	1
24 - 27		----	----	----	----	----	----	0
27 - 30		4.1	----	----	----	----	----	1
30 - 33		----	----	----	----	----	----	1
33 - 36		----	----	----	----	----	----	0
36 - 39		----	----	----	----	----	----	0
39 - 42		5.0	----	----	----	----	----	6
42 - 45		----	-10.6	----	----	----	----	5
45 - 48	5,500	5.3	-5.9	----	----	----	----	7
48 - 51		12.2	----	10.3	----	50	----	6
51 - 54		----	-11.6	----	----	----	----	6

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts
September 5, 1946 - Flight 31					
Airplane 351 Traverse 4           {             Time (EST) 155152 - 155644 Length of traverse 307.6 sec, 75,493 ft Initial heading (deg) 290           }					
0 - 3	5,500	7.2	-----	-----	3
3 - 6		9.0	-6.2	----- -10.0	4
6 - 9		5.9	-1.6	----- -7.0	7
9 - 12		5.0	-5.0	3.9 ----- 104	3
12 - 15		-----	-----	-----	0
15 - 18		-----	-----	-----	0
18 - 21		-----	-----	-----	0
21 - 24		-----	-----	-----	0
24 - 27		-----	-----	-----	0
27 - 30		-----	-----	-----	0
30 - 33		-----	-----	-----	0
33 - 36		-----	-----	-----	0
36 - 39		-----	-----	-----	0
39 - 42		-----	-----	-----	0
42 - 45		-----	-----	-----	0
45 - 48		-----	-----	-----	0
48 - 51		-----	-----	-----	0
51 - 54		-----	-----	-----	0
54 - 57		-----	-----	-----	0
57 - 60		-----	-----	-----	0
60 - 63		-----	-----	-----	0
63 - 66		5.0	-----	-----	1
66 - 69		3.4	-2.5	-----	4
69 - 72		4.7	-6.5	-----	9
72 - 75		-----	-----	-----	2
75 - 78		-----	-----	-----	0
September 6, 1946 - Flight 32					
Airplane 345 Traverse 1           {             Time (EST) - (d) Length of traverse 99.6 sec, 34,319 ft Initial heading (deg) - (d)           }					
0 - 3	22,000	3.8	-----	-----	2
3 - 6		-----	-3.2	4.8 -----	10
6 - 9		2.5	-2.5	-----	10

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 6, 1946 - Flight 32								
Airplane 345 { Time (EST) - (d) Traverse 1 { Length of traverse 99.6 sec, 34,319 ft Initial heading (deg) - (d)								
9 - 12	22,000	3.2	-----	6.1	-----	136	-----	6
12 - 15	22,500	-----	-1.9	-----	-----	-----	-----	5
15 - 18		-----	-----	-----	-----	-----	-----	3
18 - 21		-----	-----	-----	-----	-----	-----	0
21 - 24		-----	-----	-----	-----	-----	-----	0
24 - 27	23,000	-----	-----	-----	-----	-----	-----	0
27 - 30		-----	-----	-----	-----	-----	-----	0
30 - 33		-----	-----	-----	-----	-----	-----	0
33 - 36		-----	-----	-----	-----	-----	-----	0
Airplane 345 { Time (EST) - (d) Traverse 2 { Length of traverse 242.3 sec, 74,088 ft Initial heading (deg) - (d)								
0 - 3	21,500	-----	-4.7	-----	-----	-----	-----	1
3 - 6		-----	-----	-----	-----	-----	-----	0
6 - 9		-----	-----	-----	-----	-----	-----	0
9 - 12		-----	-----	-----	-----	-----	-----	0
12 - 15	22,000	-----	-3.5	-----	-----	-----	-----	2
15 - 18		-----	-----	-----	-----	-----	-----	0
18 - 21		-----	-----	-----	-----	-----	-----	1
21 - 24		-----	-----	-----	-----	-----	-----	0
24 - 27		-----	-----	-----	-----	-----	-----	0
27 - 30		-----	-----	-----	-----	-----	-----	0
30 - 33		-----	-----	-----	-----	-----	-----	0
33 - 36		-----	-----	-----	-----	-----	-----	0
36 - 39		-----	-----	-----	-----	-----	-----	0
39 - 42		-----	-----	-----	-----	-----	-----	0
42 - 45		-----	-----	-----	-----	-----	-----	3
45 - 48		-----	-5.7	-----	-----	-----	-----	4
48 - 51		-----	-3.5	-----	-----	-----	-----	4
51 - 54		-----	-----	-----	-----	-----	-----	0
54 - 57		-----	-----	-----	-----	-----	-----	0
57 - 60		3.5	-4.4	-----	-----	-----	-----	4
60 - 63		6.0	-----	7.8	-----	129	-----	2
63 - 66		-----	-5.4	-----	-6.6	-----	220	5

<sup>d</sup>No motion-picture records obtained.

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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity U <sub>max</sub> (fps)	Maximum true gust velocity U <sub>tmax</sub> (fps)	Gust gradient distance (ft)	No. of gusts
September 6, 1946 - Flight 32					
Airplane 345 { Time (EST) - (d) Traverse 2 { Length of traverse 242.3 sec, 74,088 ft Initial heading (deg) - (d)					
66 - 69	22,000	5.7	-6.0	----	3
69 - 72		----	-----	-----	2
72 - 75		----	-----	-----	1
Airplane 345 { Time (EST) - (d) Traverse 3 { Length of traverse 249.3 sec, 81,633 ft Initial heading (deg) - (d)					
0 - 3	22,000	3.5	----	-----	1
3 - 6		----	-----	-----	0
6 - 9		2.5	-2.5	-----	3
9 - 12		----	-5.7	-----	5
12 - 15		2.5	----	-----	1
15 - 18	22,500	----	-----	-----	0
18 - 21		----	-----	-----	0
21 - 24		----	-----	-----	0
24 - 27		----	-----	-----	0
27 - 30		----	-----	-----	0
30 - 33	22,000	----	-----	-----	0
33 - 36		----	-----	-----	0
36 - 39		----	-----	-----	0
39 - 42		----	-----	-----	0
42 - 45		----	-2.5	-----	2
45 - 48	22,500	----	-----	-----	0
48 - 51		----	-----	-----	2
51 - 54		----	-----	-----	0
54 - 57		----	-----	-----	0
57 - 60		----	-3.2	-----	2
60 - 63		----	-----	-----	0
63 - 66		----	-----	-----	0
66 - 69		----	-----	-----	0
69 - 72		----	-----	-----	2
72 - 75		----	-----	-----	4
75 - 78	22,500	----	-----	-----	3
78 - 81		----	-----	-----	0
81 - 84		----	-----	-----	0

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
September 6, 1946 - Flight 32					
Airplane 344 Traverse 1		{ Time (EST) 142930 - 143318 Length of traverse 255.5 sec, 71,122 ft Initial heading (deg) 90			
0 - 3	16,000	----	----	----	0
3 - 6		9.9	-8.0	----	5
6 - 9		3.5	-9.9	---- -13.5	6
9 - 12		2.9	-5.4	----	3
12 - 15		6.4	-7.7	----	6
15 - 18		10.5	-7.3	----	5
18 - 21		10.5	-9.6	----	8
21 - 24		9.6	-15.0	14.8 ----	6
24 - 27		9.3	-2.9	----	3
27 - 30		----	-3.2	---- -11.9	3
30 - 33		7.7	-3.5	----	5
33 - 36		8.9	----	----	2
36 - 39		----	-3.5	----	1
39 - 42		----	-4.2	----	2
42 - 45		5.4	----	----	1
45 - 48		----	----	----	0
48 - 51		----	----	----	0
51 - 54		----	-2.9	----	1
54 - 57		----	----	----	0
57 - 60		----	----	----	0
60 - 63		----	----	----	0
63 - 66		----	----	----	0
66 - 69		----	----	----	0
69 - 72		----	----	----	0
Airplane 344 Traverse 2		{ Time (EST) 143742 - 144219 Length of traverse 302.2 sec, 87,051 ft Initial heading (deg) 245			
0 - 3	15,500	10.2	----	----	1
3 - 6	16,000	4.5	-3.5	----	3
6 - 9		----	-4.5	----	2
9 - 12		----	-3.5	---- -6.4	2
12 - 15		7.3	-4.5	----	4
15 - 18		4.1	-2.9	----	3
18 - 21		----	-3.5	---- -6.2	1
		----	----	---- 108	

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 6, 1946 - Flight 32								
Airplane 344 Traverse 2		{ Time (EST) 143742 - 144219 Length of traverse 302.2 sec, 84,051 ft Initial heading (deg) 245						
21 - 24	16,000	----	-----	----	----	0		
24 - 27		3.5	-2.9	----	----	2		
27 - 30		2.9	-3.5	----	----	3		
30 - 33		5.4	-4.1	----	----	4		
33 - 36		4.8	-3.5	----	----	3		
36 - 39		9.5	-7.9	----	----	7		
39 - 42		10.2	-5.1	23.8	111	5		
42 - 45		7.3	-3.8	----	----	6		
45 - 48		8.3	-----	----	----	4		
48 - 51		3.8	-5.1	----	----	3		
51 - 54		4.8	-6.7	8.0	109	4		
54 - 57		6.0	-2.5	----	----	4		
57 - 60		8.3	-5.7	19.6	-15.3	30	244	7
60 - 63		8.3	-2.9	----	----	----	----	5
63 - 66		5.4	-6.0	7.4	----	263	----	3
66 - 69		2.9	-6.0	----	-4.3	----	58	2
69 - 72		11.8	-3.8	----	----	----	----	4
72 - 75		7.3	-----	----	----	----	----	3
75 - 78		5.7	-5.7	----	----	----	----	3
78 - 81		4.1	-6.4	----	----	----	----	3
81 - 84	2.9	-3.2	----	----	----	----	2	
84 - 87	2.5	-----	----	----	----	----	1	
87 - 90	----	-----	----	----	----	----	0	
Airplane 344 Traverse 3		{ Time (EST) 144727 - 145110 Length of traverse 241.5 sec, 68,911 ft Initial heading (deg) 100						
0 - 3	16,000	----	-----	----	----	----	----	0
3 - 6		----	-2.5	----	----	----	----	1
6 - 9		----	-----	----	----	----	----	0
9 - 12		----	-----	----	----	----	----	0
12 - 15		----	-3.5	----	----	----	----	1
15 - 18		2.8	-----	----	----	----	----	1
18 - 21		----	-----	----	----	----	----	0
21 - 24		2.8	-3.5	----	-12.4	----	57	3



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts	
September 6, 1946 - Flight 32						
Airplane 344 Traverse 3		{ Time (EST) 144727 - 145110 Length of traverse 241.5 sec, 68,911 ft Initial heading (deg) 100				
24 - 27	16,000	5.7	-----	-----	-----	2
27 - 30		-----	-2.8	-----	-----	4
30 - 33		6.0	-4.7	11.5	171	3
33 - 36		3.5	-2.5	-----	-----	2
36 - 39		3.8	-6.3	-----	-15.4	3
39 - 42		5.4	-3.5	-----	-----	3
42 - 45		3.5	-----	-----	-----	1
45 - 48		-----	-----	-----	-----	0
48 - 51		3.5	-----	-----	-----	2
51 - 54		2.2	-----	-----	-----	1
54 - 57		3.5	-3.5	-----	-----	2
57 - 60		2.8	-----	-----	-----	1
60 - 63		4.4	-----	-----	-----	1
63 - 66		2.8	-----	-----	-----	1
66 - 69		-----	-----	-----	-----	0
Airplane 344 Traverse 4		{ Time (EST) 145449 - 145848 Length of traverse 256.1 sec, 73,753 ft Initial heading (deg) 270				
0 - 3	16,000	-----	-----	-----	-----	0
3 - 6		4.7	-----	-----	-----	1
6 - 9		-----	-----	-----	-----	0
9 - 12		-----	-3.5	-----	-----	1
12 - 15		2.8	-----	-----	-----	1
15 - 18		4.1	-3.5	-----	-----	3
18 - 21		5.3	-----	-----	-----	4
21 - 24		5.7	-4.4	-----	-----	2
24 - 27		6.0	-3.5	11.8	57	3
27 - 30		4.1	-6.0	-----	-----	4
30 - 33		4.7	-----	-----	-----	1
33 - 36		-----	-5.0	-----	-----	1
36 - 39		3.5	-----	-----	-----	1
39 - 42		-----	-----	-----	-----	0
42 - 45		4.4	-----	-----	-----	1
45 - 48		3.5	-5.0	-----	-----	3
48 - 51		5.3	-----	6.4	87	3

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)		Maximum true gust velocity $U_{\text{tmax}}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 6, 1946 - Flight 32								
Airplane 344 Traverse 4		{ Time (EST) 145449 - 145848 Length of traverse 256.1 sec, 73,753 ft Initial heading (deg) 270						
51 - 54	16,000	----	----	----	----	----	----	0
54 - 57		----	----	----	----	----	----	0
57 - 60		6.9	-3.8	----	-8.5	----	272	2
60 - 63		----	-4.7	----	----	----	----	2
63 - 66		7.9	----	17.2	----	171	----	1
66 - 69		----	-4.1	----	----	----	----	1
69 - 72		4.1	-1.6	----	----	----	----	2
72 - 75		2.8	-2.2	----	----	----	----	2
Airplane 333 Traverse 1		{ Time (EST) 142648 - 143139 Length of traverse 312.3 sec, 83,322 ft Initial heading (deg) 80						
0 - 3	11,000	----	----	----	----	----	----	2
3 - 6	11,500	5.1	-6.7	13.2	-11.1	50	78	7
6 - 9		7.4	-8.0	----	-12.2	----	83	7
9 - 12		8.3	-5.8	----	----	----	----	9
12 - 15		13.1	-12.2	17.6	-13.2	57	46	12
15 - 18		10.9	-10.6	----	----	----	----	6
18 - 21		5.1	-6.7	----	----	----	----	5
21 - 24		8.7	-7.4	----	-18.2	----	147	12
24 - 27		5.8	-3.5	11.8	----	56	----	13
27 - 30		4.5	----	----	----	----	----	4
30 - 33		3.8	-3.5	----	----	----	----	5
33 - 36		2.9	-2.9	----	-7.9	----	156	4
36 - 39		5.1	-4.8	----	----	----	----	7
39 - 42		3.8	-3.8	----	----	----	----	5
42 - 45		4.8	-3.8	----	----	----	----	3
45 - 48		4.8	----	----	----	----	----	2
48 - 51			----	----	----	----	----	0
51 - 54	12,000	----	-3.8	----	-10.8	----	52	3
54 - 57		2.9	----	----	----	----	----	2
57 - 60		2.9	-2.9	----	----	----	----	5
60 - 63		----	-4.8	----	-11.2	----	154	4
63 - 66		3.2	-2.9	12.6	----	99	----	4
66 - 69		----	----	----	----	----	----	2

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts	
September 6, 1946 - Flight 32						
Airplane 333 Traverse 1		{ Time (EST) 142648 - 143134 Length of traverse 312.3 sec, 83,322 ft Initial heading (deg) 80				
69 - 72	12,000	----	----	----	0	
72 - 75		----	----	----	3	
75 - 78		----	----	----	1	
78 - 81		----	----	----	0	
81 - 84		----	----	----	0	
Airplane 333 Traverse 2		{ Time (EST) 143622 - 144123 Length of traverse 341.3 sec, 87,338 ft Initial heading (deg) 240				
0 - 3	11,000	----	-5.7	----	1	
3 - 6		----	----	----	0	
6 - 9		----	----	----	0	
9 - 12		----	----	----	2	
12 - 15		----	----	----	2	
15 - 18		----	-2.9	----	4	
18 - 21		5.7	----	----	2	
21 - 24		----	----	----	2	
24 - 27		----	----	----	2	
27 - 30		2.9	-2.9	----	4	
30 - 33		1.9	-4.8	----	3	
33 - 36		----	----	----	3	
36 - 39		3.2	-4.8	----	6	
39 - 42		4.1	----	7.2 -5.3	73 53	3
42 - 45		----	----	----	----	0
45 - 48		----	----	----	----	0
48 - 51		----	----	----	----	0
51 - 54		----	----	----	----	0
54 - 57		----	----	----	----	0
57 - 60		----	----	----	----	3
60 - 63		----	----	----	----	0
63 - 66		5.7	----	----	----	2
66 - 69		5.1	-3.8	8.9	74	8
69 - 72		7.0	-4.8	----	----	7
72 - 75		5.7	-4.8	10.5 -14.4	103 100	8
75 - 78		8.0	-4.8	----	----	10

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 6, 1946 - Flight 32								
Airplane 333 Traverse 2		{ Time (EST) 143622 - 144123 Length of traverse 341.3 sec, 87,338 ft Initial heading (deg) 240						
78 - 81	11,000	8.0	-3.3	----	-----	----	----	12
81 - 84		17.9	-5.7	25.2	-16.1	100	126	13
84 - 87		8.0	-6.4	13.6	-----	50	----	5
87 - 90		----	-----	----	-----	----	----	0
Airplane 333 Traverse 3		{ Time (EST) 144420 - 144821 Length of traverse 263.8 sec, 67,042 ft Initial heading (deg) 90						
0 - 3	11,000	11.1	-10.5	----	-----	----	----	4
3 - 6	10,500	8.6	-4.8	----	-----	----	----	7
6 - 9		3.8	-9.5	10.1	-----	100	----	5
9 - 12		----	-----	----	-----	----	----	1
12 - 15		3.8	-----	----	-----	----	----	4
15 - 18	11,000	----	-----	----	-----	----	----	2
18 - 21		6.0	-5.1	8.0	-----	202	----	6
21 - 24		4.8	-----	----	-----	----	----	5
24 - 27		4.8	-----	----	-7.0	----	62	4
27 - 30	10,500	7.0	-----	----	-----	----	----	4
30 - 33		----	-----	----	-----	----	----	3
33 - 36		----	-6.4	7.1	-----	50	----	6
36 - 39		----	-----	----	-----	----	----	0
39 - 42	11,000	----	-----	----	-----	----	----	1
42 - 45		----	-----	----	-----	----	----	2
45 - 48		----	-----	----	-----	----	----	0
48 - 51		----	-----	----	-----	----	----	3
51 - 54	10,500	----	-----	----	-----	----	----	3
54 - 57		----	-----	----	-----	----	----	0
57 - 60		----	-----	----	-----	----	----	2
60 - 63		----	-----	----	-----	----	----	2
63 - 66	11,000	----	-----	----	-----	----	----	3
66 - 69		----	-----	----	-----	----	----	0

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{max}$ (fps)		Maximum true gust velocity $U_{tmax}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 6, 1946 - Flight 32								
Airplane 333 Traverse 4		{ Time (EST) 145038 - 145332 Length of traverse 193.4 sec, 45,725 ft Initial heading (deg) 270						
0 - 3	11,000	----	----	----	----	----	----	3
3 - 6		----	----	----	----	----	----	1
6 - 9		5.4	-5.1	----	-15.4	----	214	7
9 - 12		4.1	-5.1	----	-10.4	----	188	7
12 - 15		7.6	-6.3	8.9	----	139	----	6
15 - 18		4.1	-5.1	----	----	----	----	8
18 - 21		5.1	----	11.5	----	36	----	9
21 - 24		----	-4.1	----	----	----	----	4
24 - 27		5.4	----	----	----	----	----	9
27 - 30		5.1	----	----	----	----	----	4
30 - 33		----	----	----	----	----	----	3
33 - 36		5.1	----	----	-8.6	----	49	6
36 - 39		5.1	----	----	----	----	----	5
39 - 42		----	----	----	----	----	----	5
42 - 45		----	----	----	-8.6	----	24	2
45 - 48		----	----	----	----	----	----	0
September 10, 1946 - Flight 33								
Airplane 348 Traverse 1		{ Time (EST) - (e) Length of traverse 103.1 sec, 33,615 ft Initial heading (deg) 260						
(f)								
Airplane 348 Traverse 2		{ Time (EST) - (e) Length of traverse 265.7 sec, 93,312 ft Initial heading (deg) 30						
(f)								
Airplane 348 Traverse 3		{ Time (EST) - (e) Length of traverse 429.5 sec, 146,588 ft Initial heading (deg) 250						
(f)								

<sup>e</sup>Clock not installed in airplane.<sup>f</sup>Failure in operation of accelerometer prevented computations for gust velocities.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)	Maximum true gust velocity $U_{t_{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
September 10, 1946 - Flight 33					
Airplane 348 Traverse 4		Time (EST) - (e) Length of traverse 284.5 sec, 93,479 ft Initial heading (deg) 160			
(f)					
Airplane 348 Traverse 5		Time (EST) - (e) Length of traverse - (g) Initial heading (deg) 300			
(f)					
Airplane 350 Traverse 1		Time (EST) 150855 - 151030 Length of traverse 103.0 sec, 33,235 ft Initial heading (deg) 270			
0 - 3	21,500	----	-----	----	0
3 - 6		----	-----	----	0
6 - 9		----	-----	----	0
9 - 12		----	-----	----	0
12 - 15		2.9	-2.2	6.0	5
15 - 18	22,000	6.7	-8.3	----	8
18 - 21		4.5	-15.6	----	9
21 - 24	21,500	9.2	-8.0	----	10
24 - 27		----	-3.5	----	10
27 - 30		15.0	-8.0	----	7
30 - 33		6.4	-17.2	----	5
Airplane 350 Traverse 2		Time (EST) - (d) Length of traverse 207.0 sec, 72,660 ft Initial heading (deg) - (d)			
0 - 3	21,500	----	-----	----	0
3 - 6		4.7	-4.4	----	2
6 - 9		----	-----	----	0
9 - 12		----	-----	----	0

<sup>d</sup>No motion-picture records obtained.<sup>e</sup>Clock not installed in airplane.<sup>f</sup>Failure in operation of accelerometer prevented computations for gust velocities.<sup>g</sup>Film supply for airspeed-altitude recorder exhausted before end of traverse.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 10, 1946 - Flight 33								
Airplane 350 Traverse 2		{ Time (EST) - (d) Length of traverse 207.0 sec, 72,660 ft Initial heading (deg) - (d)						
12 - 15	21,000	----	----	----	0			
15 - 18		----	----	----	0			
18 - 21		5.1	-5.1	----	3			
21 - 24		6.0	----	----	7			
24 - 27		4.1	----	----	3			
27 - 30		4.7	-3.5	----	4			
30 - 33		3.5	-2.2	3.5	-6.5	178	168	4
33 - 36		7.9	-8.5	----	----	10		
36 - 39		4.7	-8.5	----	-13.1	72	8	
39 - 42		6.3	-4.7	----	----	11		
42 - 45	21,500	3.5	-4.4	----	2			
45 - 48		15.5	-24.7	----	6			
48 - 51		20.9	-9.8	----	8			
51 - 54		10.7	-7.9	----	9			
54 - 57		14.2	-15.5	----	6			
57 - 60	21,000	10.4	-16.1	----	4			
60 - 63		5.4	-6.3	----	8			
63 - 66		6.3	-10.1	----	8			
66 - 69		9.8	-9.8	----	5			
69 - 72		16.8	-9.5	----	7			
Airplane 350 Traverse 3		{ Time (EST) 153255 - 153745 Length of traverse 325.2 sec, 115,672 ft Initial heading (deg) 250						
0 - 3	21,000	----	----	----	0			
3 - 6		----	----	----	0			
6 - 9		----	----	----	0			
9 - 12		----	----	----	0			
12 - 15		----	----	----	0			
15 - 18		----	----	----	0			
18 - 21		----	----	----	0			
21 - 24		----	----	----	0			
24 - 27		----	----	----	0			

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity U <sub>emax</sub> (fps)		Maximum true gust velocity U <sub>tmax</sub> (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 350 Traverse 3		{ Time (EST) 153255 - 143745 Length of traverse 325.2 sec, 115,672 ft Initial heading (deg) - 250						
27 - 30	21,000	----	-----	----	-----	----	----	0
30 - 33		10.7	-5.3	----	-----	----	----	9
33 - 36		19.7	-11.0	----	-----	----	----	8
36 - 39		13.2	-10.0	----	-----	----	----	7
39 - 42		5.6	-6.9	----	-----	----	----	6
42 - 45		5.3	-2.2	----	-----	----	----	2
45 - 48	21,500	6.3	-6.0	----	-----	----	----	7
48 - 51		9.7	-4.7	----	-----	----	----	10
51 - 54		6.6	-6.6	----	-----	----	----	8
54 - 57		9.1	-13.2	----	-----	----	----	8
57 - 60		5.0	-5.0	----	-----	----	----	3
60 - 63		----	-----	----	-----	----	----	0
63 - 66		2.5	-4.4	----	-----	----	----	4
66 - 69		5.5	-1.3	5.8	----	151	----	7
69 - 72	21,000	9.7	-8.8	----	-----	----	----	11
72 - 75		9.7	-3.8	----	-----	----	----	8
75 - 78		6.9	-3.8	----	-----	----	----	8
78 - 81		4.4	-9.4	----	-----	----	----	7
81 - 84		10.3	-4.4	21.5	----	116	----	7
84 - 87	21,500	9.1	-6.0	5.9	----	112	----	8
87 - 90		27.9	-14.1	----	-----	----	----	5
90 - 93	22,000	10.3	-16.6	----	-----	----	----	6
93 - 96		15.7	-17.9	----	-----	----	----	6
96 - 99		10.3	-19.4	----	-----	----	----	6
99 - 102		9.4	-11.6	----	-----	----	----	7
102 - 105	22,500	17.6	-20.1	----	-----	----	----	7
105 - 108		10.0	-13.8	----	-----	----	----	7
108 - 111		9.4	-5.3	----	-----	----	----	3
111 - 114	23,000	4.7	-4.1	----	-----	----	----	3
114 - 117		3.1	-----	----	-----	----	----	1



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)		Maximum true gust velocity $U_{\text{tmax}}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 331 Traverse 1		{ Time (EST) 151230 - 151412 Length of traverse 108.7 sec, 34,938 ft Initial heading (deg) 330						
0 - 3	16,000	----	-2.2	----	-2.8	----	130	1
3 - 6		3.2	-----	----	-----	----	-----	1
6 - 9		3.8	-3.2	7.1	-----	32	----	6
9 - 12		5.1	-7.0	----	-----	----	-----	7
12 - 15		7.0	-5.7	----	-13.7	----	94	5
15 - 18		6.7	-7.6	----	-----	----	-----	8
18 - 21		5.4	-5.7	11.8	-----	62	----	5
21 - 24		4.8	-3.8	----	-----	----	-----	7
24 - 27		3.8	-5.7	13.3	-----	224	----	6
27 - 30		3.2	-3.8	----	-----	----	-----	7
30 - 33		3.8	-5.1	----	-----	----	-----	4
33 - 36		----	-2.5	----	-----	----	-----	1
Airplane 331 Traverse 2		{ Time (EST) 152442 - 152722 Length of traverse 176.8 sec, 57,383 ft Initial heading (deg) 20						
0 - 3	16,000	6.5	-8.9	15.7	-----	128	----	8
3 - 6		14.6	-9.5	----	-----	----	-----	8
6 - 9		3.2	-5.7	7.3	-----	64	----	6
9 - 12		10.1	-3.2	----	-----	----	-----	6
12 - 15		----	-----	----	-----	----	-----	0
15 - 18		----	-2.8	----	-----	----	-----	1
18 - 21		----	-----	----	-----	----	-----	0
21 - 24		----	-----	----	-----	----	-----	0
24 - 27		2.5	-2.2	----	-----	----	-----	2
27 - 30		6.0	-7.9	18.9	-----	167	----	9
30 - 33		6.0	-6.0	----	-----	----	-----	6
33 - 36		7.0	-5.4	----	-4.4	----	163	5
36 - 39		12.0	-9.2	----	-----	----	-----	6
39 - 42		15.5	-14.2	----	-----	----	-----	8
42 - 45		3.2	-5.4	----	-----	----	-----	7
45 - 48		12.7	-4.4	----	-7.8	----	129	8
48 - 51		5.4	-10.4	----	-----	----	-----	6

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x .103	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)		Maximum true gust velocity $U_{\text{tmax}}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 331 Traverse 2		{ Time (EST) 152442 - 152722 Length of traverse 176.8 sec, 57,383 ft Initial heading (deg) 20						
51 - 54	16,000	6.6	-10.8	----	-10.2	----	68	6
54 - 57		8.5	-4.4	----	----	----	----	4
57 - 60		----	----	----	----	----	----	0
Airplane 331 Traverse 3		{ Time (EST) 153714 - 154132 Length of traverse 277.4 sec, 94,226 ft Initial heading (deg) 240						
0 - 3	16,000	3.1	----	----	----	----	----	1
3 - 6		----	----	----	----	----	----	0
6 - 9		----	----	----	----	----	----	0
9 - 12		----	----	----	----	----	----	0
12 - 15		----	-7.8	----	----	----	----	2
15 - 18	16,500	15.7	-6.0	9.7	----	89	----	5
18 - 21		6.3	-8.2	----	----	----	----	6
21 - 24		7.8	-3.5	----	----	----	----	6
24 - 27		7.5	-5.0	----	----	----	----	5
27 - 30		3.8	-8.5	----	----	----	----	4
30 - 33		10.0	-7.5	17.2	----	75	----	7
33 - 36		14.4	-5.3	----	-12.2	----	136	7
36 - 39		6.6	-5.6	----	----	----	----	10
39 - 42		15.1	-11.6	----	----	----	----	6
42 - 45		3.1	-11.0	----	----	----	----	2
45 - 48	16,000	----	-2.5	----	----	----	----	1
48 - 51		6.0	----	----	----	----	----	2
51 - 54		2.8	-2.5	5.0	----	210	----	2
54 - 57		----	----	----	----	----	----	0
57 - 60		2.8	-4.7	----	----	----	----	3
60 - 63		3.8	-7.2	----	-4.9	----	179	4
63 - 66		2.8	-1.9	----	----	----	----	6
66 - 69		9.1	-1.3	----	-6.1	----	181	3
69 - 72		----	-1.3	----	-5.0	----	214	1
72 - 75		2.8	----	----	----	----	----	1
75 - 78		2.8	-1.9	----	----	----	----	2
78 - 81		1.9	-2.2	----	----	----	----	7
81 - 84		5.6	-7.8	----	----	----	----	5

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)		Maximum true gust velocity $U_{t\max}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 331 Traverse 3		{ Time (EST) 153714 - 154132 Length of traverse 277.4 sec, 94,226 ft Initial heading (deg) 240						
84 - 87	16,000	11.0	-15.1	----	----	----	----	7
87 - 90		14.8	-7.8	----	----	----	----	6
90 - 93		5.0	-10.0	----	----	----	----	6
93 - 96		----	----	----	----	----	----	0
Airplane 331 Traverse 4		{ Time (EST) 155605 - 155902 Length of traverse 188.5 sec, 62,766 ft Initial heading (deg) 180						
0 - 3	16,000	----	----	----	----	----	----	0
3 - 6	16,500	----	-2.5	----	----	----	----	1
6 - 9		12.4	-4.9	----	----	----	----	5
9 - 12		7.7	-7.7	24.3	----	229	----	6
12 - 15		19.5	-2.5	----	----	----	----	8
15 - 18		4.6	-10.8	----	----	----	----	11
18 - 21		12.4	-5.3	----	----	----	----	5
21 - 24		5.6	-5.9	----	----	----	----	5
24 - 27		4.3	-6.8	8.7	----	193	----	5
27 - 30		3.1	-3.7	----	----	----	----	3
30 - 33		----	----	----	----	----	----	5
33 - 36	16,000	5.3	-3.7	----	----	----	----	5
36 - 39		6.2	-5.6	----	----	----	----	5
39 - 42		3.1	-2.5	7.6	----	133	----	2
42 - 45		8.7	-5.3	----	----	----	----	6
45 - 48		4.6	-4.6	----	----	----	----	5
48 - 51		----	-4.6	----	----	----	----	3
51 - 54		5.3	-3.4	----	-5.6	----	103	4
54 - 57		4.0	-3.4	----	----	----	----	7
57 - 60		4.6	-2.2	----	----	----	----	2
60 - 63		5.6	----	9.8	----	177	----	2
Airplane 331 Traverse 5		{ Time (EST) 160526 - 160715 Length of traverse 127.4 sec, 41,642 ft Initial heading (deg) 340						
0 - 3	16,000	----	-2.5	----	----	----	----	1
3 - 6		2.2	-2.5	----	----	----	----	3

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts		
September 10, 1946 - Flight 33							
Airplane 331 Traverse 5		{ Time (EST) 160526 - 160715 Length of traverse 127.4 sec, 41,642 ft Initial heading (deg) 340					
6 - 9	16,000	----	-----	----	----	0	
9 - 12		----	-----	----	----	0	
12 - 15		3.7	-----	----	----	1	
15 - 18		3.1	-2.5	----	----	6	
18 - 21		3.1	-2.5	----	----	3	
21 - 24		11.4	-3.7	----	----	5	
24 - 27		9.2	-2.5	----	----	5	
27 - 30		3.1	-6.8	----	----	8	
30 - 33		9.2	-12.9	18.9	63	6	
33 - 36		2.8	-9.2	----	----	6	
36 - 39	11.7	-3.4	----	----	7		
39 - 42	5.8	-4.6	----	----	4		
Airplane 333 Traverse 1		{ Time (EST) 150915 - 151030 Length of traverse 86.4 sec, 25,111 ft Initial heading (deg) 270					
0 - 3	11,000	----	-4.2	----	----	1	
3 - 6		4.2	-4.2	----	----	6	
6 - 9		10.9	-10.9	9.0	29	7	
9 - 12		12.5	-10.6	----	-8.9	30	4
12 - 15		9.6	-7.1	----	-25.5	187	6
15 - 18		9.6	-----	12.6	91	3	
18 - 21		----	-----	----	----	0	
21 - 24		----	-----	----	----	0	
24 - 27		6.4	-----	13.9	28	1	
Airplane 333 Traverse 2		{ Time (EST) 152326 - 152555 Length of traverse 234.0 sec, 71,613 ft Initial heading (deg) 10					
0 - 3	11,000	3.2	-----	----	----	1	
3 - 6		4.8	-4.1	----	-10.6	180	2
6 - 9		4.1	-----	5.3	118	2	
9 - 12		3.5	-----	----	----	2	
12 - 15		2.5	-3.2	----	----	2	

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity U <sub>max</sub> (fps)	Maximum true gust velocity U <sub>tmax</sub> (fps)	Gust gradient distance (ft)	No. of gusts			
September 10, 1946 - Flight 33								
Airplane 333 Traverse 2		{ Time (EST) 152326 - 152555 Length of traverse 234.0 sec, 71,613 ft Initial heading (deg) 10						
15 - 18	11,000	5.1	-----	6.8	-----	118	-----	3
18 - 21		15.9	-6.7	-----	-----	-----	-----	4
21 - 24		6.4	-8.9	12.1	-----	30	-----	7
24 - 27		13.4	-10.5	12.7	-6.0	30	33	7
27 - 30		5.4	-----	-----	-----	-----	-----	4
30 - 33	11,500	5.7	-4.8	-----	-----	-----	-----	3
33 - 36		8.0	-14.3	-----	-7.5	-----	59	7
36 - 39	11,000	9.2	-7.6	-----	-----	-----	-----	4
39 - 42		6.7	-13.7	6.1	-----	45	-----	3
42 - 45		-----	-5.1	-----	-----	-----	-----	1
45 - 48		7.6	-----	-----	-----	-----	-----	1
48 - 51		-----	-5.7	-----	-9.8	-----	87	1
51 - 54		13.7	-4.1	-----	-----	-----	-----	5
54 - 57		4.1	-5.4	-----	-----	-----	-----	5
57 - 60		4.1	-----	-----	-----	-----	-----	3
60 - 63		5.1	-7.6	-----	-----	-----	-----	5
63 - 66		10.5	-7.3	-----	-----	-----	-----	7
66 - 69		8.9	-9.5	-----	-----	-----	-----	10
69 - 72		6.4	-5.7	-----	-----	-----	-----	4
Airplane 333 Traverse 3		{ Time (EST) 153458 - 153946 Length of traverse 314.1 sec, 96,939 ft Initial heading (deg) 240						
0 - 3	11,500	6.0	-7.6	-----	-----	-----	-----	4
3 - 6		8.8	-6.6	-----	-----	-----	-----	6
6 - 9		6.3	-12.3	-----	-----	-----	-----	5
9 - 12		5.4	-3.2	-----	-----	-----	-----	6
12 - 15		2.8	-----	-----	-----	-----	-----	1
15 - 18		10.4	-3.8	15.9	-----	183	-----	4
18 - 21	11,000	3.2	-10.1	-----	-----	-----	-----	5
21 - 24		8.8	-7.3	-----	-----	-----	-----	8
24 - 27		6.0	-3.8	-----	-----	-----	-----	3
27 - 30		7.3	-8.5	-----	-----	-----	-----	2
30 - 33		10.7	-7.3	-----	-----	-----	-----	3

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued.

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{e_{max}}$ (fps)		Maximum true gust velocity $U_{t_{max}}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 333 Traverse 3		{ Time (EST) 153458 - 153946 Length of traverse 314.1 sec, 96,939 ft Initial heading (deg) 240						
33 - 36	11,000	9.2	-3.8	----	----	----	----	6
36 - 39		7.3	-6.9	----	----	----	----	8
39 - 42		7.9	-9.2	----	----	----	----	4
42 - 45		4.4	-6.9	----	-7.9	----	32	4
45 - 48		3.2	----	----	----	----	----	2
48 - 51		----	----	----	----	----	----	0
51 - 54		----	----	----	----	----	----	0
54 - 57		9.8	----	6.8	----	64	----	2
57 - 60		3.2	-3.2	8.1	----	275	----	2
60 - 63		4.1	-3.2	----	----	----	----	3
63 - 66		----	----	----	----	----	----	0
66 - 69		6.3	-2.2	10.5	-10.8	188	63	4
69 - 72		----	----	----	----	----	----	0
72 - 75		3.8	----	----	----	----	----	1
75 - 78	10.1	-11.1	----	----	----	----	5	
78 - 81	7.6	-5.7	----	----	----	----	4	
81 - 84	13.9	-17.7	----	-33.7	----	233	7	
84 - 87	11,500	10.1	-9.8	----	----	----	8	
87 - 90		17.1	-12.0	13.1	----	156	6	
90 - 93		8.2	-7.6	6.8	----	122	3	
93 - 96		4.1	-3.2	----	----	----	4	
96 - 99		----	----	----	----	----	0	
Airplane 333 Traverse 4		{ Time (EST) 155342 - 155750 Length of traverse 285.4 sec, 87,726 ft Initial heading (deg) 180						
0 - 3	11,500	7.5	-10.9	----	----	----	----	4
3 - 6	11,000	5.0	-8.1	----	----	----	----	2
6 - 9		8.1	-10.0	----	----	----	----	6
9 - 12		6.3	-5.9	----	-13.5	----	62	5
12 - 15		8.1	----	----	----	----	----	5
15 - 18		6.6	-4.4	----	----	----	----	4
18 - 21		6.6	-7.5	12.6	----	45	----	4
21 - 24		31.0	-11.6	----	----	----	----	3

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)		Maximum true gust velocity $U_{\text{tmax}}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 333 Traverse 4		{ Time (EST) 155342 - 155750 Length of traverse 285.4 sec, 87,726 ft Initial heading (deg) 180						
24 - 27	11,000	14.7	-3.8	----	-----	----	----	4
27 - 30		15.9	-18.1	----	-----	----	----	5
30 - 33	11,500	12.5	-9.4	----	-----	----	----	6
33 - 36		14.7	-8.4	9.8	-----	56	----	9
36 - 39		7.8	-7.2	----	-----	----	----	3
39 - 42		12.2	-4.7	14.8	-----	61	----	4
42 - 45		6.6	-5.0	7.1	-----	90	----	5
45 - 48		5.0	-----	6.0	-----	45	----	3
48 - 51		----	-----	----	-----	----	----	0
51 - 54	11,000	3.8	-----	----	-----	----	----	1
54 - 57		3.8	-----	----	-----	----	----	2
57 - 60		4.1	-----	----	-----	----	----	2
60 - 63		----	-----	----	-----	----	----	0
63 - 66		3.1	-4.4	----	-----	----	----	4
66 - 69		9.7	-----	----	-----	----	----	2
69 - 72		5.6	-4.1	----	-----	----	----	3
72 - 75		5.9	-7.8	----	-----	----	----	4
75 - 78		5.0	-----	----	-----	----	----	4
78 - 81		----	-2.2	----	-----	----	----	1
81 - 84		5.9	-4.7	----	-3.7	----	94	7
84 - 87		5.6	-----	5.6	-----	63	----	2
87 - 90		----	-----	----	-----	----	----	0
Airplane 333 Traverse 5		{ Time (EST) 160333 - 160504 Length of traverse 170.0 sec, 50,000 ft Initial heading (deg) 330						
0 - 3	11,000	----	-----	----	-----	----	----	0
3 - 6		6.5	-8.4	11.3	-----	44	----	2
6 - 9		5.0	-5.0	----	-13.4	----	117	4
9 - 12		----	-----	----	-----	----	----	0
12 - 15		6.5	-----	----	-5.6	----	60	3
15 - 18		6.5	-5.0	----	-----	----	----	4
18 - 21		6.8	-6.5	----	-----	----	----	4
21 - 24		6.5	-5.0	----	-9.6	----	43	6
24 - 27		3.4	-----	----	-----	----	----	2

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{smax}$ (fps)	Maximum true gust velocity $U_{tmax}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 10, 1946 - Flight 33								
Airplane 333 Traverse 5		{ Time (EST) 160333 - 160504 Length of traverse 170.0 sec, 50,000 ft Initial heading (deg) 330						
27 - 30	11,000	7.8	-----	9.8	-----	119	-----	3
30 - 33		7.2	-----	-----	-----	-----	-----	4
33 - 36		-----	-----	-----	-----	-----	-----	0
36 - 39		4.7	-3.7	7.2	-----	62	-----	3
39 - 42	10,500	4.7	-----	-----	-----	-----	-----	5
42 - 45		6.5	-----	-----	-----	-----	-----	3
45 - 48	11,000	-----	-3.1	-----	-----	-----	-----	2
48 - 51		-----	-----	-----	-----	-----	-----	0
Airplane 345 Traverse 1		{ Time (EST) - (d) Length of traverse 210.4 sec, 52,277 ft Initial heading (deg) - (d)						
0 - 3	5,500	-----	-6.8	-----	-----	-----	-----	6
3 - 6		6.4	-10.6	-----	-----	-----	-----	7
6 - 9		17.0	-6.8	26.3	-11.0	144	247	6
9 - 12		10.6	-6.4	-----	-6.0	-----	152	6
12 - 15		9.0	-9.6	18.4	-----	137	-----	10
15 - 18	6,000	6.8	-8.0	-----	-----	-----	-----	10
18 - 21		2.9	-3.9	7.9	-----	47	-----	2
21 - 24		4.8	-----	-----	-----	-----	-----	2
24 - 27		6.1	-4.5	-----	-----	-----	-----	5
27 - 30		2.9	-4.5	-----	-----	-----	-----	3
30 - 33		3.5	-----	-----	-----	-----	-----	3
33 - 36		4.5	-4.2	-----	-----	-----	-----	2
36 - 39		3.5	-6.8	-----	-----	-----	-----	4
39 - 42		-----	-3.5	-----	-----	-----	-----	1
42 - 45		-----	-3.5	-----	-----	-----	-----	2
45 - 48		4.2	-3.2	-----	-----	-----	-----	5
48 - 51		-----	-3.2	-----	-----	-----	-----	1
51 - 54		-----	-2.9	-----	-----	-----	-----	1

<sup>d</sup>No motion-picture records obtained.



TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 10, 1946 - Flight 33								
Airplane 345 Traverse 2		{ Time (EST) - (d) Length of traverse 336.4 sec, 86,405 ft Initial heading (deg) - (d)						
0 - 3	6,000	----	-----	----	-----	----	-----	0
3 - 6		5.1	-6.7	----	-----	----	-----	7
6 - 9		8.6	-7.0	----	-----	----	-----	6
9 - 12		10.5	-9.6	----	-----	----	-----	6
12 - 15		3.5	-6.4	----	-----	----	-----	5
15 - 18		8.6	-6.1	----	-----	----	-----	7
18 - 21		6.7	-3.2	----	-----	----	-----	5
21 - 24		4.8	-3.2	----	-----	----	-----	2
24 - 27		4.1	-5.1	----	-----	----	-----	5
27 - 30		7.0	-5.1	----	-----	----	-----	4
30 - 33		4.1	-----	----	-----	----	-----	4
33 - 36		-----	-----	----	-----	----	-----	0
36 - 39		-----	-6.1	----	-10.4	----	150	1
39 - 42		2.9	-2.9	----	-----	----	-----	2
42 - 45		3.5	-3.8	----	-----	----	-----	6
45 - 48		-----	-6.4	----	-7.6	----	304	2
48 - 51		5.4	-6.4	----	-----	----	-----	4
51 - 54		9.6	-6.1	17.2	-----	257	-----	5
54 - 57		3.5	-3.8	----	-----	----	-----	4
57 - 60		6.7	-6.4	----	-----	----	-----	6
60 - 63		5.7	-3.8	8.8	-----	54	-----	6
63 - 66		4.5	-5.7	----	-----	----	-----	2
66 - 69		6.1	-5.7	----	-----	----	-----	7
69 - 72		8.0	-9.6	11.9	-----	77	-----	6
72 - 75		8.6	-8.6	----	-----	----	-----	9
75 - 78		9.6	-9.9	----	-----	----	-----	5
78 - 81		16.6	-12.1	29.4	-19.7	159	245	6
81 - 84		12.7	-5.7	----	-----	----	-----	6
84 - 87		4.1	-4.5	5.5	-----	102	-----	5
Airplane 345 Traverse 3		{ Time (EST) - (d) Length of traverse 411.7 sec, 91,727 ft Initial heading (deg) - (d)						
0 - 3	6,000	----	-----	----	-----	----	-----	0
3 - 6		----	-----	----	-----	----	-----	0

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts			
September 10, 1946 - Flight 33								
Airplane 345 Traverse 3		{ Time (EST) - (d) Length of traverse 411.7 sec, 91,727 ft Initial heading (deg) - (d)						
6 - 9	6,000	----	----	----	0			
9 - 12		4.1	-7.9	----	5			
12 - 15		4.7	-7.3	6.8	----	4		
15 - 18		----	----	----	----	0		
18 - 21		8.2	-4.1	14.5	----	2		
21 - 24		19.3	-10.8	12.3	----	4		
24 - 27		19.9	-15.2	----	----	9		
27 - 30		8.2	-6.0	----	-16.2	87	4	
30 - 33		7.0	----	----	----	----	1	
33 - 36		6.6	-6.0	----	----	----	2	
36 - 39		----	-6.0	----	-9.0	----	185	1
39 - 42		----	----	----	----	----	----	0
42 - 45		2.2	-7.3	10.9	----	121	----	6
45 - 48		4.1	-4.4	----	----	----	----	2
48 - 51		6.0	-6.6	----	----	----	----	3
51 - 54		4.4	-3.5	----	----	----	----	3
54 - 57		----	-7.6	----	-11.4	----	257	2
57 - 60		7.9	-7.6	----	-18.0	----	248	7
60 - 63		3.8	-3.5	----	----	----	----	4
63 - 66		----	-7.0	----	----	----	----	1
66 - 69		8.2	-6.9	----	-10.2	----	44	5
69 - 72		7.9	-10.1	----	-13.4	----	48	6
72 - 75		3.5	-11.1	----	----	----	----	5
75 - 78		7.6	-10.4	----	----	----	----	4
78 - 81		6.3	-7.0	----	----	----	----	5
81 - 84		7.6	-3.5	----	----	----	----	4
84 - 87	6,500	12.7	-10.4	----	----	----	6	
87 - 90		10.1	-9.2	----	----	----	8	
90 - 93		6.3	-16.5	----	----	----	2	
Airplane 345 Traverse 4								
		{ Time (EST) - (d) Length of traverse 287.1 sec, 65,922 ft Initial heading (deg) - (d)						
0 - 3	5,500	10.3	-9.7	----	----	----	5	
3 - 6		9.7	-10.0	----	----	----	4	

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity U <sub>max</sub> (fps)		Maximum true gust velocity U <sub>tmax</sub> (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33								
Airplane 345 Traverse 4		{ Time (EST) - (d) Length of traverse 287.1 sec, 65,922 ft Initial heading (deg) - (d)						
6 - 9	5,500	5.3	-9.4	----	-----	----	-----	5
9 - 12		11.6	-10.9	----	-12.0	----	216	5
12 - 15		6.6	-18.5	----	-----	----	-----	7
15 - 18		11.9	-9.7	----	-----	----	-----	5
18 - 21		3.8	-19.1	----	-----	----	-----	7
21 - 24		12.2	-16.9	----	-----	----	-----	7
24 - 27		6.3	-10.9	----	-----	----	-----	6
27 - 30		----	-14.7	----	-----	----	-----	2
30 - 33		7.8	-6.9	13.0	-----	133	-----	6
33 - 36		4.4	-11.3	----	-----	----	-----	3
36 - 39		----	-8.4	----	-----	----	-----	4
39 - 42		3.8	-6.9	----	-8.2	----	118	4
42 - 45		----	-3.4	----	-----	----	-----	1
45 - 48		----	-11.6	----	-----	----	-----	2
48 - 51		----	-6.9	----	-----	----	-----	1
51 - 54		----	-6.9	----	-----	----	-----	1
54 - 57		3.8	-7.2	----	-----	----	-----	4
57 - 60		----	-6.3	----	-----	----	-----	1
60 - 63	4.7	-5.9	----	-----	----	-----	3	
63 - 66	----	-----	----	-----	----	-----	0	
Airplane 345 Traverse 5		{ Time (EST) - (d) Length of traverse 153.3 sec, 39,553 ft Initial heading (deg) - (d)						
0 - 3	6,000	----	-9.7	----	-----	----	-----	1
3 - 6		----	-5.0	----	-----	----	-----	1
6 - 9		----	-5.0	----	-----	----	-----	1
9 - 12		----	-----	----	-----	----	-----	0
12 - 15		----	-6.2	----	-----	----	-----	1
15 - 18		3.7	-9.0	----	-10.4	----	289	4
18 - 21		7.5	-6.2	----	-----	----	-----	2
21 - 24		4.7	-7.5	----	-13.6	----	133	4
24 - 27	2.5	-5.6	----	-----	----	-----	4	

<sup>d</sup>No motion-picture records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Concluded

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{max}$ (fps)		Maximum true gust velocity $U_{tmax}$ (fps)		Gust gradient distance (ft)		No. of gusts
September 10, 1946 - Flight 33.								
Airplane 345 Traverse 5		{ Time (EST) - (d) Length of traverse 153.3 sec, 39,553 ft Initial heading (deg) - (d)						
27 - 30	6,000	3.4	-6.2	----	-----	----	----	5
30 - 33		----	-4.7	----	-----	----	----	1
33 - 36		5.9	-5.6	----	-----	----	----	4
36 - 39		6.2	-9.3	----	-----	----	----	6
39 - 42		----	-----	----	-----	----	----	0

<sup>d</sup>No motion-picture records obtained.

NATIONAL ADVISORY  
COMMITTEE FOR AERONAUTICS

TABLE II.- SUMMARY OF DRAFT MEASUREMENTS FROM FLIGHTS  
OF P-61C AIRPLANES WITHIN THUNDERSTORMS

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Tra-verse no.	Draft location from cloud entry (ft)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
9-5-46	31	333	26,000	a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
		348	21,000	a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
		345	11,000	a <sub>1</sub>				
				2	9,262	17,066	7,804	14.1
				3	32,293 49,420	38,892 56,811	6,599 7,391	10.3 20.7
				4	39,664	43,056	3,392	-15.1
		351	6,000	a <sub>1</sub>				
				a <sub>2</sub>				
				3	46,034	52,220	6,186	-8.0
				a <sub>4</sub>				
9-6-46		345	21,000	a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
		344	16,000	a <sub>1</sub>				
				2	58,570 72,930	62,994 79,381	4,424 6,451	19.9 18.7

<sup>a</sup>No draft velocities indicated by records.

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COMMITTEE FOR AERONAUTICS

TABLE II.- SUMMARY OF DRAFT MEASUREMENTS - Continued

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Tra-verse no.	Draft location from cloud entry (ft)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
9-6-46	32	344	16,000	3	24,219	31,008	6,789	12.4
				a <sub>4</sub>				
				a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
9-10-46	33	333	11,000	a <sub>4</sub>				
				a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
				a <sub>4</sub>				
		348	26,000	a <sub>1</sub>	52,836	56,050	3,214	23.7
				2				
				a <sub>3</sub>				
				a <sub>4</sub>				
				b <sub>5</sub>				
		350	21,000	1	16,492	18,769	2,277	31.0
					15,000	19,930	4,930	-18.3
					20,241	23,447	3,206	-10.3
				2	23,955	33,540	9,585	5.8
					54,440	63,741	9,301	-14.5
		331	16,000	3	41,424	52,487	11,063	8.1
					64,150	71,517	7,367	-21.9
					84,100	92,500	8,400	39.3
				1	8,433	20,977	12,544	11.7
				2	35,900	40,100	4,200	12.2
				3	35,516	43,419	7,903	32.1
				4	12,890	24,583	11,693	20.0
				5	23,344	32,323	8,979	16.2

<sup>a</sup>No draft velocities indicated by records.<sup>b</sup>Records for complete traverse not obtained.

TABLE II.- SUMMARY OF DRAFT MEASUREMENTS - Concluded

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Tra-verse no.	Draft location from cloud entry (ft)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
9-10-46	33	333	11,000	1	9,000	11,449	2,449	-38.4
				2	20,845	23,906	3,061	25.0
				3	82,281	87,000	4,719	36.3
				a <sub>4</sub>				
				a <sub>5</sub>				
		345	6,000	1	10,968	13,996	3,028	31.0
				2	7,531	13,700	6,169	11.0
					51,444	57,449	6,005	9.5
					68,162	80,267	12,105	10.7
				a <sub>3</sub>				
				4	12,943	15,799	2,856	-24.4
					15,799	19,815	4,016	17.8
					19,815	25,445	5,630	-22.3
				a <sub>5</sub>				

<sup>a</sup>No draft velocities indicated by records.

NATIONAL ADVISORY  
COMMITTEE FOR AERONAUTICS

TABLE III.- SUMMARY OF INDICATIONS OF AMBIENT  
AIR TEMPERATURE WITHIN THUNDERSTORMS

Date	Flight no.	Airplane no.	Traverse no.	Time (EST)	Distance from cloud entry (ft)	Milliammeter reading
9-5-46	31	351	2	153257	0	800
				153315	4,800	850
				153330	8,500	900
				153345	12,100	1050
				153400	15,900	1100
				153427	22,600	1100
			3	154257	0	925
				154315	4,600	950
				154430	23,800	950
				154445	27,500	1000
				154500	31,600	1050
				154600	47,700	1050
				154611	49,300	1025
			4	155152	0	850
				155215	6,000	950
				155230	10,000	850
				155245	13,800	825
				155300	17,500	950
				155315	21,200	1000
				155330	25,000	1025
				155445	43,400	1025
				155500	47,100	1000
				155515	50,500	1000
				155530	54,000	1075
				155545	57,500	1075
				155600	61,000	1025
				155615	64,600	1000
				155630	68,300	950
				155644	71,800	1000
9-6-46	32	344	1	142930	0	230
				142945	3,900	240
				143000	8,400	250
				143015	12,600	245
				143030	15,500	245
				143045	21,100	250
				143100	25,100	250
				143115	29,300	240



TABLE III.- SUMMARY OF INDICATIONS - Continued

Date	Flight no.	Airplane no.	Traverse no.	Time (EST)	Distance from cloud entry (ft)	Milliammeter reading
9-6-46	32	344	1	143245	54,000	240
				143300	58,100	230
				143315	62,100	230
			2	143742	0	220
				143800	5,000	230
				143830	13,800	230
				143845	18,000	240
				143915	26,300	240
				143930	30,400	245
				143945	34,500	345
				144000	38,600	230
				144015	43,000	230
				144030	47,400	220
				144100	56,000	220
				144115	60,500	230
				144130	64,700	235
				144145	69,100	230
				144200	73,800	230
				144215	78,300	240
			3	144727	0	250
				144900	26,400	250
				144915	30,700	240
				144945	39,000	240
				145000	43,200	225
				145030	51,900	225
				145045	56,000	235
				145100	60,500	240
				145110	63,400	235
			4	145449	0	235
				145515	6,200	240
				145530	11,400	240
				145545	15,900	230
				145615	24,500	230
				145630	28,700	245
				145645	33,000	245
				145700	37,300	240
				145715	41,800	250
				155745	50,500	250
				155800	55,000	260
				155815	59,000	250
				155845	67,900	250

TABLE III.- SUMMARY OF INDICATIONS - Continued

Date	Flight no.	Airplane no.	Traverse no.	Time (EST)	Distance from cloud entry (ft)	Milliammeter reading
9-10-46	33	350	1	150855	0	120
				150915	6,600	125
				150930	11,600	135
				150945	16,500	135
				151000	21,100	140
				151015	25,400	145
				151030	30,600	145
			3	153255	0	120
				153315	6,500	125
				153330	11,300	130
				153345	16,100	130
				153400	21,000	120
				153430	30,800	120
				153445	36,100	125
				153500	41,700	120
				153515	46,800	120
				153530	52,000	130
				153545	57,800	130
				153600	63,600	135
				153615	69,000	120
				153745	102,200	120
		331	3	153714	0	200
				153745	9,900	200
				153800	14,400	210
				153845	29,200	210
				153900	34,300	205
				153915	39,100	210
				158930	44,500	220
				153945	49,500	220
				154000	54,800	215
				154015	60,000	205
				154030	64,400	200
				154115	81,600	200
				154130	86,900	205
			4	155605	0	190
				155630	8,000	200
				155645	12,900	200
				155700	17,900	210
				155715	22,800	220

TABLE III.- SUMMARY OF INDICATIONS - Concluded

Date	Flight no.	Airplane no.	Traverse no.	Time (EST)	Distance from cloud entry (ft)	Milliammeter reading
9-10-46	33	331	4	155730	27,800	220
				155745	32,500	230
				155800	37,500	220
				155900	58,000	220
			5	160526	0	200
				160600	12,000	200
				160615	16,800	210
				160630	21,600	210
				160645	26,500	205
				160700	31,500	210
				160715	36,600	210

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